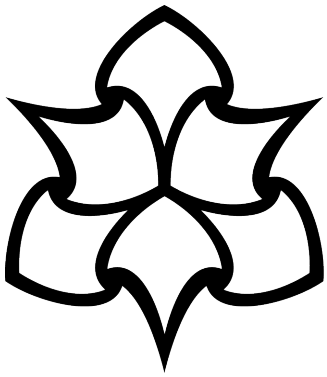

2 School design in Africa

The background

Introduction

This chapter focuses on the key issues that influence school planning and design in sub-Saharan Africa. These include: climate, religion, post-colonial nationalist development policies, socio-economic needs and the opportunity costs of education in relation to local economic realities. A detailed analysis is undertaken of each of these issues and their influence on the development of school planning and design programmes in Africa. This chapter examines specifically the effects of these issues on post-colonial Anglophone countries which is the main focus of this book.

African Schools have had a long, historical established presence in towns and villages across the continent, however the factors that have influenced their design and development have been unique. Those that have had the most influence on schools provision, design and planning can broadly be examined under the following themes:

- **environmental**
- **socio-political**
- **economic**

There are other issues which have had an influence on African school design and planning that could be examined; however' the three factors identified here are considered the most critical for the purposes of this volume, as evidenced by earlier findings from research work undertaken into the history of school design in Africa.[1] These three factors are relevant to schools across Africa, in Lusophone and Francophone states, and not solely the Anglophone countries which are the book's main focus. The school examples discussed in this chapter attempt to reflect the universality of these themes in African schools across the continent and further afield in emerging countries throughout the world.

Environment

Strictly speaking, education or learning can take place in any environment where classrooms or teaching – learning spaces – can be placed. However, to achieve the optimal environment for learning, aside from good teachers

and adequate textbooks and learning materials, the characteristics of the classroom are equally important.

The climatological factors affecting the built environment of schools are of specific relevance to all classrooms. Africa's continental mass has nearly the entire range of sub-tundra climate types.[2] The continent's geography also means much of its land mass is in the tropical zone, and therefore the majority of built spaces have to respond to the environmental comfort needs of warm to hot climate through appropriate passive, or non-mechanically assisted, building design.

Historically, vernacular buildings were designed with climate responsiveness incorporated in to their form.[3] Contemporary tropical buildings, including classrooms designed for affluent schools, often incorporate mechanical cooling devices ranging from electric fans to air conditioning systems to provide environmental comfort. This is both expensive due to the energy costs involved with running mechanical systems such as air conditioning, and often difficult to maintain as power cuts for long periods regularly occur across Africa.[4]

School design history

Christian missionaries were responsible for building the first significant number of schools in Africa. This was because their proselytisation involved not only church building, but also the setting up of schools and health care

Figure 2.1 Etching of Early Girls' School in Lagos
In Echeruo M. Victorian Lagos

facilities to improve the livelihoods of their converts and residents in the communities in which they were based. The missionary builders involved in constructing this infrastructure, particularly the school buildings, soon evolved standard classroom designs which complemented the earlier mission church designs. The formwork for these buildings was designed to be prefabricated so they could be easily shipped out to missions across the world.[5]

These became design primers for school construction across the main regions of mission comprising Africa and Asia, and also the Caribbean archipelago. There are historic missionary diaries which give details of the siting, construction and organisational design of their mission classrooms.[6] Initially, the first classrooms were placed on the ground floor or as part of the missionary domestic residence. With time, the school became a separate building, integral to the mission 'compound', often simply called 'the mission'.[7] By the late 19th century, indigenous church communities and missions became established in Africa. This led to the establishment of building workshops and the training of indigenous builders, carpenters and joiners who were able to use local materials to build the next generation of missionary schools.

Environmental design of schools

The most intense period during which Western education was spread across Africa, through the efforts of both missionary and colonial parties, was from the early to mid-20th century. Developing the design of school buildings to meet with adequate construction and thermal comfort standards thus became an early focus for British colonial environmental design research bodies, who developed school design guidelines, discussed later in the chapter, for use in the colonies, particularly in the tropics including Africa.

A key reason for this was because in that era, schooling involved rote based teaching and was entirely classroom based in delivery. School learning focused on the acquisition of skills often referred to as the 'three Rs': reading, writing and arithmetic. Furthermore, schooling was introduced as a regular Monday–Friday activity, which was not affected by other cultural practices such as traditional festivals or other activities which children might be engaged in such as subsistence farming.

This was in contrast to the experiential traditional learning systems for female and male initiation ceremonies discussed in Chapter 1 in which the cultural schooling or learning involved an engagement with activities within the community and outside the specific initiation 'houses'. Western education was located in the classroom. It was therefore difficult to adapt existing traditional built forms to respond to the specific functional requirements of the Western educational classroom. The use of traditional shelter and space in the tropics responds to a lifestyle in which rooms and other indoor spaces are used predominantly for storage and sleeping. Most traditional daytime activities did, and still do, take place outdoors. Missionary school design had preceded the development of government school design standards.

Schools such as St Gregory's College Lagos (f. 1928) show the height of missionary design. The historic original buildings were built on elevated footings featured large wooden louvred windows and ventilated hipped roofs to allow for cross-ventilation below, through and above the main spaces. The orientation of most large windowed classrooms at right angles to the prevailing southeast trade winds also allows for maximum airflow across the room, and thus optimal thermal comfort for students. The generous verandah allow for adequate shading to classroom walls, whilst the size of the windows ensured that there was adequate daylight for working without artificial lighting during the day. The school shows a combination of local and international materials use in construction. The tropical hardwood for the main structure would have been locally sourced; however, the cast iron veranda details suggest these were likely to have been imported from Glasgow.[8]

Government schools built in British colonies furthered this attention to environment. The coastal schools, such as Kings College, Lagos (f. 1909) and Achimota College, Ghana (f. 1924), demonstrate the attention to climate in orientation and design. The same is true of the colonial government-built colleges in northern parts of West Africa. **These include Wusasa College (f. 1929) in Northern Nigeria** where the significant distance from the coast and lack of trained Western builders presumably contributed to the colonial government's decision to have the college constructed in local 'tubali' stabilised earth.

Figure 2.2 St Gregory's College Lagos, Nigeria
Author's own image

Figure 2.3 College, Nigeria
Author's own image

Colonial school design guidelines which determined school building across the colonies were based on British classroom requirements, and on a British school timetable. This meant that the design of the tropical school had to accommodate African pupils being in school from the morning to the hottest part of the day.[9] The 'standard' classroom design which evolved would have benefited from the guidance available from the aforementioned missionary design primers and also early colonial planning guidance which was based on early research studies from the schools of tropical medicine and hygiene in London and Liverpool.

By the end of WW2, with the development of research studies into human response to the tropical climate that had been initially focused on sailors involved in the merchant navy war effort, building science and environmental became a techno-scientific discipline in its own right. Thermal comfort was introduced as a concept which could be physically measured and quantified using equations related to temperature humidity and human response. Also, daylighting could be measured which meant that adequate light levels for tasks such as reading could now be recommended.

These new environmental science measurements had a direct effect on school design in the post-WW2 era and were incorporated into design guidance for schools housing and other social facilities being built in British

colonies through to the post-independence era.[10] It is likely that African schools built in the postwar period benefited from design guidance which had been developed via the Colonial and then Overseas Building Service section of the Building Research Establishment, Garston, England.[11] The schools may also have had design advice from researchers working on the influence of tropical climate on buildings and comfort in laboratories attached to the London School of Tropical Hygiene and Medicine (LSTM), later in collaboration with the Architectural Association (AA) Tropical Studies Unit and eventually the AA Tropical School in London.[12]

Thus schools such as Barewa College (f. 1921), Zaria[13] and also the post-independence built 'Unity' School, Federal Government College, Sokoto,[14] (f. 1968) both located in northern Nigeria, had these new design guidelines incorporated in their design. The two schools demonstrate environmental design principles for optimum siting, thermal comfort and daylighting in the dry arid northern region of West Africa where they are located.

The schools are of concrete block construction with asbestos concrete roofing and their classrooms have been designed around courtyards to allow for the cooling effected by air movement into shaded internal courtyard spaces open to the elements. The school designs have been adapted from the typical vernacular architecture found in this climatic region.[15] Furthermore, classroom windows are set at high level to avoid direct glare which is essential for comfortable reading and studying conditions in this dry, arid region. The control of the windows also reduces the penetration of sandy 'harmattan' air during the dry season into these classrooms.

Environmental design principles for tropical schools also incorporated the adoption of landscape principles such as the positioning and utilisation of trees and other plants in respect to building orientation. These principles were developed as guidelines which encouraged architects and planners to incorporate selected vegetation, comprising both trees and plants in their planning with respect to building orientation and window positioning especially. Good landscaping and building position increased the possibilities for natural ventilation in warm climates, and used in combination with courtyard design elements in drier climates could improve night time cooling. Glare and overheating could also be reduced with judicious planting of specific plant species near school classrooms.[16]

Other educational facilities

Libraries and institutions with an extramural educational remit were also designed to take into account the new environmental design guidelines. The architects Max Fry and Jane Drew demonstrated early on in their West African career their commitment to tropical design for wider community and educational purposes than solely schools. Initially this was communicated in their 1940s design primer, Tropical Housing for the Tropics (1947).[17] Later on

as they became involved in the national school design programmes in Ghana, the educational outreach remit spread to include libraries, technical colleges, colleges of arts science, and technology in anglophone West Africa. Arguably this culminated in the masterplan and design of key buildings for the University of Ibadan, Nigeria including the much acclaimed University Library.[18]

The American architect Max Bond's Bolgatanga library (1966) also provided a unique culture- and context-specific response in its design. The building successfully provided both the library and a space for other cultural-educational needs of this semi-rural community in this dry arid climatic region of Northern Ghana.[19] James Cubitt's Umuahia Regional Library (1964) was in contrast designed as a response to its warm humid tropical location in southeastern Nigeria.

The library's location and orientation ensured that the resultant design ensured that all reading rooms had the maximum effect of natural cross-ventilation by the extensive use of floor-to-ceiling louvres positioned at adjacent walls in all public areas. Sustainability issues were also considered, as a sculpted water tank storage system was designed to ensure water could be stored for use by the library as a backup supply source to the unreliable pipe-borne water system in the town.[20]

Figure 2.4 Umuahia Regional Library, Nigeria
Author's own image

School design guides: the Overseas Building Notes, UNESCO school design guides and school standards

The influence of the environment as a factor in school design in Africa can be seen then to have been an important consideration to school planners and builders. Guidelines and advice for school design had been codified since the missionary involvement in the design of churches and their associated 'missions' across Africa.

As discussed in Chapter 1, missionary schools – which formed the majority of schools in Africa until the 1950s – were largely designed and constructed by missionary staff with building skills with the help of local mission-taught converts who had acquired sufficient carpentry and construction skills to enable them work on missionary building projects. The initial schools that were established in the early 18th century were often built as 'ad hoc' structures to missionary residences where basic tuition, in addition to specific religious instruction in catechism, for example, took place.[21]

The regulation and inspection of these schools was initially the responsibility of the missions whose home countries provided much of the funding, personnel and initial infrastructure for these pioneer educational institutions. This continued up until the setting up of education inspectorates as part of the colonial administration established in the British protectorates in Nigeria, the Gold Coast, Kenya and also in the South African provinces.

The colonial education departments employed school inspectors whose job it was to ensure that not only appropriate standards of educational performance were met, but also that the school buildings were properly designed and maintained to colonial tropical school building standards, which was a condition of being eligible for grant aid. This was effectively a method by which the colonial government would support the running costs and development of non-government-established schools in colonies across the world through 'grants in aid', via the Colonial Development and Welfare Fund.[22]

The colonial office involved in funding the development of social infrastructure such as housing and schools in the tropics further worked with the colonial welfare office to develop a set of design guides. These were initially written as design notes, which superseded earlier publications such as Fry and Drew's aforementioned *Village Design in the Tropics* (1947).

The colonial government's memos sent to the colonies on design were further developed into official building notes and guides as tropical building research became an established discipline located within the Government-run Building Research Establishment (BRE) in Garston, England.[23] These guides and notes influenced the development the United Nations Educational Social and Economic and Cultural Organisation's (UNESCO) international school design guides, as members of the schools research team at the BRE and the Architectural Association (AA) Tropical School collaborated with the UNESCO school planning team. The UNESCO guidelines were produced from the 1960s up until the early 1980s. These guidelines are now discussed.

Colonial – Overseas Building Notes: By the postwar years, environmental science, aided by tropical research studies carried out during WW2 and onwards, improved design knowledge related to building in the tropics significantly.[24] The Colonial Office at the time was able to share this knowledge with its officers involved in the Public Works Departments in colonies across Africa and elsewhere through its publication of a series of building design guides called the Colonial Building Notes. As the colonies attained independence, the Colonial Building Notes were renamed the Overseas Building Notes but performed the same function.[25] A number of these publications did specifically suggest school building design guidelines, which formed the basis for both government schools and also as guidelines for missionary and non-government-run schools in Africa. This remained the case up until the development of national school guidelines, which were also influenced by the UNESCO school guidelines.[26]

UNESCO School Guidelines: At the end of WW2, the formation of UNESCO as a wing of the United Nations not only ensured the promotion of education and social development, but also through its education wing set up a school buildings programme with offices in Asia, Africa and headquarters in Paris.[27] The building research programmes had offices set up in each continent and were involved in both encouraging new research and funding new school design, and also setting continental-regional guidelines for school design. These offices had research work into various aspects of school design, from school siting to furniture design undertaken by a range of architects from the UK and the USA mainly, but also with a number of European architects from countries such as France, and in the case of Palumbo, from Italy.[28] The resulting UNESCO school design guidelines were used by international school design consultants such the UK's RMJM, which worked in association with the Nigerian firm Ekwueme and Associates on the National 'Model School building Programme' in post-independence Nigeria.[29] The guidelines used for these schools were eventually incorporated as international (UNESCO) standards into National School Design Standards across much of Africa, and are still form the basis for school design standards for schools in Anglophone Africa including Nigeria and Ghana.[30]

Other environmental design guides

In pre-1994 South Africa, the government-funded Council for Scientific and Industrial Research (CSIR) research organisation published its own guidelines which also referred to the UNESCO school design standards and provided design advice for environmental comfort, focusing on issues such as ventilation in schools. These guidelines, although based on empirical scientific research findings, also incorporated apartheid rhetoric to justify different thermal comfort standards for white and 'bantu' (black) schools in the 1960s.[31]

The CSIR's research informed the development of 'standards and norms' for all of South Africa's racially segregated schools. These remained in place

until the dismantling of the apartheid national school building programme in the 1980s. From that decade onwards, the increased involvement of NGOs and corporate charities such as the Urban Foundation in the funding, design and provision of schools in cities such as Port Elizabeth ensured that the apartheid-influenced school design guidelines of the past were replaced by contemporary design thinking and ideas for schools. Since the full dismantling of national rule and move to democracy in 1994, South Africa has created a new education act which also incorporates a more contemporary set of school design standards and norms, whose implementation will be discussed in the next chapter.[32]

In the international arena in the 1970s and 1980s, the environmental design advice given in Koenigsberger et al.'s (1973) *Manual of Tropical Design* and in Baker's later (1987). Passive and Low Energy design *for Tropical Island Cli- mates* – whilst not specifically focused on school design – provided relevant criteria for design decisions for different tropical environments. Both books have had international popularity, particularly the *Manual of Tropical Design* which has been translated into a number of languages. This is likely to have been due to the links of the authors such as Otto Koenigsberger to tropical design via the AA school and his international consultancy work. A decade later Baker's book, a result of a project undertaken at the Commonwealth Secretariat on environmental design in the tropical island climates, and his subsequent work with the Martin Centre at the University of Cambridge, particularly with respect to lighting research, helped popularise his book and international work on passive energy approaches to design.[33]

Since the 1990s, a number of tropical design guides have also emerged in Australia and Southeast Asia. However, their focus has been on private domestic and commercial buildings and not on public institutional infrastructure such as schools.[34] There have, however, been a number of voluntary sector and aid organisations that have in effect promoted their international approach and guidelines to designing schools in rural areas of the tropics, and particularly Africa. These include the US-based architecture teams MASS design and UrbanLab, the Glasgow-based Orkidstudio and the reincarnation of the UK-based charity the International Technology Development Group (ITDG) as Practical Action.[35]

On the African continent, South Africa's post-apartheid schools, built from 1995 onwards, have benefited from the most comprehensive set of school regulations and guidelines that have been drawn up and come about as a result of the full reorganisation of its now nationally integrated education system. Spearheaded by the South African research body the CSIR, these guidelines provide a clear break with South Africa's segregated educational past.[36] The 1995 school design guidance takes into account pedagogy, costs, local involvement and environmental responses. The administrative make up of South Africa means that the country's different provinces are given the latitude to interpret and respond to the guidance in relation to their educational priorities.

Figure 2.5 Vukani School, Khayelitsha, Western Cape, South Africa
Author's own image

This has led to the design of post-1994 schools in some administrative provinces such as in the Western Cape, having a lighter regulatory touch. In the Western Cape, architects such as Albertyn Wessels, Joe Noero, Groenwaald Preller, Wolf and associates, are given the freedom to interpret the school design conceptuallykeeping within the spatial and function guidelines as set out. This contrasts significantly from the past government's apartheid-determined school design standards that specified specific school and classroom designs for the differ-ent racially categorised schools across South Africa.[37] Contemporary South African schools designed by the aforementioned architects and others have been successful in projecting the differences and original approaches that have been developed by the creation of a direct working relationship with both the provincial educational departments and also importantly the com- munities in which the new schools are built.[38]

Economic and socio-political factors

In building construction terms, classrooms remain one of the most economical structures to design as they essentially comprise four walls, windows, a roof and a ceiling. This core design versatility has meant that the physical

costs of school structures are not high. With the establishment of formal Western education via the missionary groups in Africa, the mission school was initially attached to the church or clergyman's quarters, prior to construction as a separate unit.

The costs of construction were usually affordable, as the basic build meant that local craftsmen were easily trained to carry this out and in rural areas local materials, such as mud block for walls and thatch for roofing, could be adapted for use in schools construction. Thus, compared to recurring the costs of employing school staff and tutors, the school and classroom were relatively inexpensive.

From the post-WW2 period in the late 1940s onwards, the use of concrete blocks and various forms of metal sheet roofing further reduced the time costs of construction and improved the permanency of schools as compared to traditional thatch and mud; schools made from 'modern' materials lasted longer as they required less maintenance and were easier to build with less skilled local labour.

In this period also, the construction of most basic primary schools was undertaken by colonial education departments, financed by the aforementioned Colonial Development and Welfare Fund. In the southern parts of Ghana and Nigeria in West Africa, schools were also being funded and built by enterprising local community groups, often in association with local missionary denominations. This was at a time that coincided with the reduction of direct missionary involvement with educational provision in this region.[39]

Thus in Eastern and Western Nigeria, for example, a number of communities were involved in building schools which were adopted by local missionary groups to become primary and, in some cases, secondary schools.[40] This meant that up until Nigeria's independence, community constructed schools which had been handed over to religious missions could then avail themselves of same grant-aid funding to enable the employment of the right quota of staff required to teach the schools, in exchange for being subjected to annual review by the colony's educational inspectorate.

Today, as the typical design of classrooms across Africa has remained essentially unchanged, the basic construction costs of most primary and secondary schools have remained relatively low at (62,200 Ksh/m^2).[41] However, in rural areas and informal settlements in cities, schools are often located in hard-to-reach locations, which makes their connection to basic infrastructure such as pipe-borne water, sanitation, power and reliable access roads difficult or impossible to achieve. This has the knock-on effect of increasing the real cost of school provision as the add on infrastructure costs significantly increase school provision costs in these areas.[42] Similarly, overcrowded informal settlements that have closer access to areas of economic activity in cities, despite having good service connections to electricity and water, have the problem of land acquisition for schools, because of prime urban land costs in Africa as elsewhere globally. This again has an effect on real school classroom costs in urban areas.

Future school costs

The design of future African schools is likely to respond to the emerging international educational landscape. This global focus is moving more towards universal access of all learners to open online learning systems and on digital connectivity, rather than on building more of the traditional brick-and-mortar school classrooms. As the costs of technology fall and 'know how' becomes more open source, future school design costs are set to remain affordable as the traditional modes of learning are set aside for more fluid and less classroom dependent pedagogies. *Learning spaces*, as today's classrooms are now called, are being designed to be flexible places in which different modes of contemporary learning: peer-to-peer, online and collaborative learning events can take place.[43]

The 'opportunity costs' and other non-economic costs of school design

The opportunity costs, as opposed to the financial costs, of education and school design can be extremely high. In traditional African societies, the displacement of local knowledge systems and processes by the mission – including the church, the school house and other social infrastructure such as hospitals and agricultural demonstration farms – had lasting disrupting effects on all aspects of local life. Old traditions were changed forever as the receivers of 'book education' became more important than village elders, and the new Christian religion replaced traditional religion in communities across Africa.

Education and its main apparatus the school thus was a total societal disrupter in much of Africa. Societies and villages which did not embrace the school and its new ways of thought quickly lost their status and relevance in the new order. As Achebe's trilogy on Eastern Nigeria records, the ultimate cost of not doing this could have tragic consequences, with the eponymous hero Okafor paying the ultimate price for not being able to cope with his son running away to join the new missionary converts.[44]

As stated earlier, by the early 1950s governments, missions and enlightened communities in parts of East and West Africa were rapidly contributing to the building of schools as the need and benefits of a Western education for local children and youths was understood as being a critical resource for entry into the modern, capitalist world. In some West African communities, rivalries were rife over which home town associations were able to build local schools first in their villages.[45]

During this era, well publicised government backed universal education schemes, which involved the construction of numbers of primary schools across the southern part of Nigeria, were also in place.[46] The Gold Coast (later to become Ghana) also in this period (1951 and 1961) had its First and Second National School Buildings Programmes.[47]

The school buildings in these universal education programmes acquired political symbolism as they proved the commitment of the then colonial government to contributing to the educational welfare of its colonies.

In contrast at this same period in South Africa, the imposition of the race-based 'apartheid' education system in Nationalist South Africa, from 1948 onwards, arguably had the opposite effects.[48] The Nationalist government's 'apartheid' school building policy, involving different construction programmes for the country's differently identified racial groupings, was implemented to justify its 'separate but equal' education of all South African students.[49] The 1976 'Soweto' uprising, and the increase in civil resistance which subsequently followed, demonstrated the failure of this school policy socio-politically. Schools were often both the sites and targets for the violent protests which broke out in townships in opposition to the imposition of the 'apartheid' education policies as the Soweto and subsequent events demonstrated.

Global education policies

By the 1960s, when most of Africa had attained, or was in the process of attaining, self-rule, the International Development Agency (IDA) – a wing of the World Bank set up to provide direct funding aid and assistance for global development projects – was able to fund development assistance for the construction of schools across Africa in association with UNESCO. Aside from the financial assistance, via loans and technical know-how, the international political imperative has been to lift countries out of poverty by investing in more schools and school infrastructure, increasing teacher education, and overall improving enrollment, particularly at primary level education.[50]

Unfortunately, the global economic turmoil in the 1970s, culminating in the oil crisis, led to the collapse of many African state economies. Also, a spate of political coups d'etat had crushing effects on African countries. At the international level also, the fluid financial deals that had been available from the post-colonial era of the 1950s and 1960s dried up as World Bank lending was less favourable to African and other emerging nations than the former IDA loans and bilateral agreements with countries had been.

International moves led by UNESCO and other organisations towards attaining universal primary education for all globally also stalled by the 1970s. A series of international policies and conferences related to this had taken place since the 1960s, as discussed in Chapter 1. The main outcome of these conferences had been the call for universal enrolment in basic education across this world. To achieve this, the various conference declarations pushed for the increase in school enrolment of children and the eradication of illiteracy, especially amongst females and excluded groups.[51]

By the late 1970s, with funding for UNESCO being severely diminished with the pulling out of the organisation for political reasons by the USA, the World Bank became the main instigator and funder of these global policy programmes.[52]

These policies, from the late 1970s onwards, worked in conjunction with the World Bank's education projects and reports. The 1980s reports supported a self-help 'sweat equity' approach to physical school building, with more investment being made in the funding of better teacher education and equipment for schools than for school building. This move towards de-linking state or institutional provision of schools and their infrastructure was further strengthened with the neo liberalist policies gaining popularity globally from the mid-1980s onwards. Private provision of education was supported, which resulted in a mixed economy of educational provision, with the state, formalised private providers such as churches and private groups, small and large, being able to set up and offer education.[53]

State education systems generally remain (fee) free, in this case fees are not paid but parents have to pay for textbooks, school uniforms and other items for their children's schooling, so the absence of fees does not mean that education is actually 'free' but are often under- funded and consequently limited in classroom capacity. 'Free' also has tobe qualified: books, equipment and school uniforms are often not free, and other costs including school building fund payments are not unusual, particularly for well-regarded high-status state schools in countries such as Nigeriaand post-1994 South Africa.

Well-financed private schools in Africa do not disguise their upfront costs, and have become popular for Africa's growing middle classes since their introduction in the 1990s. Religious and third sector organisations, such as the Aga Khan Foundation and the Catholic Church, have also become education providers, or re-entered the education market in the case of religious groups particularly. Although many such organisations are able to offer some philanthropic scholarships for the poor and needy, most children in attendance are fee-paying.[54] There is often limited provision of scholarships for poorer academically able students, but in reality, few poor students have had the education preparation to pass the selective entrance exams for these elite schools.

Facilities at private schools can vary widely. Generally, as might be expected, the higher the fee paid, the better the facilities and teaching delivered to students. At the extreme end of the private spectrum are the schools run in residential homes in informal settlements across Africa. These schools are often cheaper in terms of actual fees or levies paid than local free government schools. However they can offer a more bespoke form of tuition to pupils, due to the relatively lower class sizes, and also a more quantifiable fee cost, than state schools which often levy other 'costs' on parents for school provision that some poorer parents cannot afford.[55] In some cases also, this form of basic private educational provision may have better outcomes in respect to academic pass rates than poorly supported state provision.[56]

Contemporary schools

African schools today bear a strong resemblance in their operation and design particularly to those built in the early 20th century. Unlike Latin America and some parts of Southeast Asia, school and classroom design have

shown no radical changes in their provision for most students. Education programmes in continental Africa have not undergone the transformations of mass education programmes found elsewhere such as in Latin America or post-WW2 Eastern Europe.

In Tanzania, Nyerere's *Ujaama* Schools in the 1960s and 1970s attempted to challenge the inherited Western–Christian missionary-fashioned education system in Tanzania with their focus on mass 'education for self-reliance' through local learning and the promotion of the village school model. The *Ujaama* programme came to an end with the collapse of the Tanzanian economy in the 1980s and the country subsequently adopting World Bank reform measures and moving towards the prevailing African neoliberal Western education model. This has led to a mixed approach to educational provision, with private and state actors involved in the provision of education and with this the design of schools within a less regulatory environment.

Decades later in South Africa, the post-apartheid 1994 South African National Education Policy sought to fundamentally change and democratise the racially segregated education system that the National Party had put in place.[57] The country's education system is now non-racialized; however, arguably there is now instead an economic class divide to school provision and classroom design. The poor, who are predominantly black, have the worst access to good schooling and classrooms built since 1994 in townships and poorer areas are less likely to have benefited from new school design concepts focusing on child-centred learning and schools as community assets. Thus, despite progress made in some provinces such as Cape Town, most South African schools have not benefited from progressive 21st century school design. Furthermore, the national education curriculum has had limited transformation from the historic Western exam-based curriculums in place in the early 20th century. This has meant schools have remained designed to both symbolise and sustain the symbolism of the traditional historic school building and their classrooms, the elite schools in the country being good examples of how this remains perpetuated.

In West Africa similarly, the West African Examinations curriculum designed in the 1950s, despite having considerable African-sourced content, was modelled on the Cambridge Certificate examinations system, and focused on academic subjects required to be studied for university entrance examinations. Today's WAEC examination curriculum has more technical and vocational subjects, but the elite schools which students most want to attend retain the traditional curriculum. These schools are also designed and maintained to emulate the English public school and associated traditional classroom designs that they symbolise.

The nature of school design norms and standards have remained relatively unchanged across most of Africa. In Nigeria for example, the current school design standards owe their creation from the IDA-UNESCO school design programme and technical assistance era in the 1960s. Also in Ghana, the standards developed during the first and second national school building

programmes in the 1950s, augmented further by schools guidelines used to develop school buildings in the new towns of Tema and Akosombo in the 1960s, form the basis of school design standards and norms in Ghana, and have also had little change. The post-Jomtien Conference 'Education for All' Declaration basic education programmes adopted across the world including Africa, despite increasing school and classroom building programmes, did not alter the design of these schools.

The new methods of delivering mass education via computer-based distance learning schemes, as found in India and some other parts of Southeast Asia, become popular at basic education level have also yet to take root in Africa.[58] The rapid changes in education engagement brought about over the past decade with the miniaturisation of computing and the ubiquity of online access, however, is likely to change this.[59]

One notable change that has taken place has been the introduction of school feeding programmes at kindergarten and early primary school levels in many countries. This has been as a direct result of UNESCO and national education policies in many African countries seeking to respond to the 1995 United Nations Millennium Development Goals (MDG) which focused not only on the need to have all children access a basic education, but also the need to improve maternal health and with it child welfare up to early

Figure 2.6 School Feeding Programme, Kontonkoshie, Ghana
Author's own image

(pre-school) years.[60] This is because it was proved by evidence-based research that school feeding programmes are particularly effective in improving not only maternal and child health care, but also educational attainment for children.[61]

Future schools

African school classroom of the future will still be required to deliver the same fundamental educational experience for their users. Education and knowledge systems, however, are likely to depend less on traditional textbook study and teacher-directed learning, as interactive online systems make remote learning more possible for much of the continent. *Learning spaces*, as future classrooms are being called, will exist but may begin to inhabit non-traditional spaces, libraries and other communal places instead of dedicated classrooms. Also, as learning becomes less teacher-focused, and shifts towards peer-to-peer and remote learning formats, the design of the traditional classroom is set to become redundant.

This may take some time, considering the vastness of the African continent and the remote regions to which education has yet to make inroads since the last century's numerous international drives discussed in Chapter 1. However, considering the speed of penetration of the mobile phone and GSM, Global System for Mobile networks, now the standard digital standard for mobile telephony that enable its functionability across the world. Networks in Africa, the main conveyor of the new 'e-learning' systems, timescales may be much faster than envisioned. There are already a number of trial e-learning projects taking place across Africa, and information communications technology systems from the one laptop per child projects to new e-learning systems that already exist, but they form only a small although growing segment of Africa's school landscape. This leap from the historic classroom 'chalk and talk' setting to a more distributed learning approach will eventually happen. When it does it will represent a transformational step in classroom design and educational history in Africa.

Summary

This chapter has investigated the three key themes – environment, socio-economic issues and policies – which have had the most influence on school design and its development in Africa. It concludes that Africa – despite its schools having benefited from the actions of positive players and philanthropists from the early missionaries and benign colonial governments through to local community development unions and progressive international education policies, promoting and funding school building to enable universal access to basic education – remains the continent which has been least able to meet with the international targets of education enrolment set by the UN in its SDGs, which have now become MDGS.

The new Sustainable Development Goal target in relation to education does shift the goalposts for access to basic education targets in Africa, relying

less on enrollment figures in schools and more on longer-term access to basic education by a wider range of the population than just school-age children. It remains, however, by no means certain that African states can deliver on this target in the SDG timeframe. This is particularly uncertain as the schools being built do not respond to the wider remit of basic education and lifelong learning in their continued use of the 1950s–1960s-developed traditional school design standards and norms.

As discussed, despite the continent's centuries-long engagement with Western education, the challenges remain that the first missionary pioneers encountered as they set up the first schools in the 19th century such as inaccessibility to rural areas and lack of basic infrastructure such as communications, sanitation, and power. Possibly the most critical challenge, as it was then, is local hostility to 'Western' education, remain the same, if not worse, in areas such as parts of northeastern Nigeria controlled by the Islamist group Boko Haram today.[62]

Further contemporary challenges now include access to new 'e-learning' technologies and also the teachers and administrative set up to engage with these potentially critical learning tools for the future. The design of future classrooms or learning spaces that allow for the successful engagement with these technologies might make a major difference in the future that might help overcome some, if not all, of the hindrances in educational delivery today.

For urban Africa, which is projected to increasingly be the birthplace of most of Africa's 21st century youth,[63] this is likely to make access to a good education considerably easy. How this will work out in parts of remote, rural Africa is less certain, despite many anecdotal case studies suggesting its potential.[64] There will be no doubt a reckoning and assessment of these as we move to the middle of the 21st century. What is clear is that as these technologies change learning globally, Africa will not be left out. The continent should – it is hoped – therefore gain from this new diffusion of educational practice, and the effect this will have on the design of traditional school infrastructure that has been synonymous with the African education narrative since the mid-19th century.

It may be that there will be more liberal, pragmatic education policies promoted by the international agencies such as UNESCO. These policies might allow for a more mixed approach to education infrastructure and delivery, via a variety of private and state providers.[65] For school infrastructure this might be a positive move, as research for this chapter has found that the national regulatory school design standards and norms guidelines, which are typical of most African state education systems, remain based on UNESCO and colonial design guidelines of the 1950s and 1960s.

These international guidelines might be seen to restrict the design and delivery of more child-student-centred classroom designs by non-traditional government school building providers. However, this might not be the case. The example cited of the adoption advisory guidelines for standards and

norms adopted successfully by architects and designers involved in the design of post-1994 schools in the Western Cape Province in South Africa being a case in point.

Producing appropriate relaxed guidelines for designing spaces for digital learning is likely to prove equally challenging. This will be discussed in later chapters. It is, however, clear that few state schools have been able to benefit from classrooms that respond to the spatial needs of laptop-focused collaborative learning in the classroom.

Environmentally also, African school design has benefited from sustained historic research and development of demonstration school plans, taking into account the specific environmental factors related to building design in the tropics. African schools have already benefited from design guidelines which largely incorporated the research undertaken by UNESCO, the Architectural Association Tropical Design School and other early environmental design pioneers, whose work was incorporated in the UNESCO international school design guidelines.

Environmental conditions in schools can now be recorded using data loggers and sensor recordings, and used to successfully simulate and predict different environmental conditions in schools. This technology is already in use in the modelling of school classrooms internationally. These findings are already being incorporated into developing school design guidelines in in tropical regions including Australia and Singapore. These findings are also being incorporated by architects and designers in South African schools, and by the international design teams such as MASS Design, Orkidstudio and others involved in school building projects in Africa.

At a socio-political level also, both governments and the parental community are aware of the need to engage with education and the power of new technologies in future development. There remain communities which for cultural or religious reasons remain resistant to educational uptake on gender, religion or for other reasons, but the overwhelming majority are aware of the economic and social benefits of their offspring acquiring basic education.

There does, however, remain the need to incorporate the new design knowledge related to school provision in areas of e-learning to environmental sustainability with the historic themes related to community building and development which are central to the success of school buildings in Africa at urban and rural level. Currently e-learning and sustainability issues are viewed and considered separate from the objective of most Africa policymakers, whose focus remains the building more classrooms to the now historic traditional UNESCO guidelines regulation format. The community link to the school is often limited, except where explicitly encouraged as in the post-1994 South African school design guidelines.

It is hoped that a more negotiated approach to the target-driven global education standards and a better understanding of the need to engage communities in the school design process from inception to post-occupancy use

will help with this. The new SDGs, therefore, have the challenge to 'nudge' the actors involved in school design, from policymakers to the local community into becoming part of the process.

Whatever the case, there is likely to be a change in future African school design and its provision, from this historical overview of relative stasis, and limited gradual transformation over time, to the rapid technological developments from the late 20th century to the present day. Optimistically, the globalising nature and spread of new media and digital technologies in learning should, if not allow Africa to 'leapfrog' its educational infrastructure to Western standards, at least significantly improve childhood learning environments across the continent.

Notes

1 This includes; Uduku, O. (1993) *Factors Affecting School Design in Nigeria*. PhD Thesis, University of Cambridge, Uduku, O. (1994) *Factors Affecting School Design in South Africa*. Report, Centre for African Studies, University of Cambridge, Uduku, O. (1993) *Factors Affecting School Design in Ghana*. Report, Centre for African Studies, University of Cambridge, Uduku, O. (2008) *Designing Schools as Development Hubs for Learning*. Final Report University of Bristol, and Uduku, O. (2015) Spaces for 21st Century Learning. In *Routledge Handbook on International Learning and Development*. London: Routledge, pp. 196–209.

2 For the purposes of this chapter, the koppen classification of climate is used, with tundra being the most northerly typology found at the poles and warm humid being the most 'tropical'. See Kottek, M., Grieser, J., Beck, C., Rudolf, B. and Rubel, F. (2006) World Map of the Koppen-Geiger Climate Classification Updated. *Meteorol. X*, 15, pp. 259–263.

3 Rapoport, A. (1969) *House Form and Culture*. London: Prentice Hall, Oliver, P. (1976) *Shelter in African*. London: Barrie and Jenkins, and Denyer, S. (1978) *African Traditional Architecture*. London: Heinemann have written major texts on vernacular architecture, which have identified the link between local buildings and climate.

4 School prospectuses in Nigeria such as Atlantic Hall School and the American International School, both in Lagos, for example, indicate that their classrooms have air conditioning. URLS Atlantic Hall, *FAQs*, www.atlantic-hall.net/faqs/ American International School of Lagos, *History Blog*, www.aislagos.org/about-aisl/aisls-history-50-years-of-the-american-international-school-lagos. Both accessed May 2017.

5 See Herbert, G. (1978) *Pioneers of Prefabrication: The British Contribution in the Nineteenth Century*. Baltimore, MD: Johns Hopkins University Press, and Thompson, N. (2014) *A Study of Early Corrugated Buildings in Scotland*. www.arct. cam.ac.uk/Downloads/ichs/vol-3-3097-3116-thompson.pdf.

Coopers Catalogue, https://archive.org/stream/IllustratedCatalogueOfGoodsManufacturedAndSuppliedByW.c.SperLtd/IllustratedComplete_djvu.txt. Both accessed 2017.

6 See, for example, the diaries of Waddell, H. M. (1863) *The Diaries of H.M. Waddell and the Calabar Mission*. Edinburgh: National Library of Scotland Archives/ Centre for Special Collections University of Edinburgh, or for Lovedale Missionary Institution (1904) *Report for Lovedale Missionary Institution 1903*. Alice, Eastern Cape, South Africa: Lovedale Press.

7 Uduku, O. (2000) The Colonial Face of Educational Space. In L. Lokko (ed.), *White Papers Black Marks*. London: Athlone Press, pp. 44–65.
8 In the case of Hope Waddell College, which is located near Calabar, this is circumstantially likely as there is documentation that King Eyamba Bassey had an iron house imported from Scotland in the same era. see note 5, and also Fafunwa, B. (1974) *History of Education in Nigeria*. London: Allen and Unwin.
9 The timetable for Hope Waddell College Calabar in can be seen in Aye, E. (1986) *Hope Waddell Training Institution Life and Work: 1894–1978*. Edinburgh: National Library of Scotland.
10 The use of environmental science also informed the development of school design guidelines developed by the newly formed postwar UNESCO school building research units that collaborated with the Architectural Association Tropical School Design Course for the tropics to develop tropical school building design guidelines and prototypes used in Ghana, for example. Thus, the AA Committee minutes in 1963 record J. Owuso Addo as having gained a certificate in the Educational Building Course. The school design guidelines developed at such courses still form the basis for school design standards and guidelines in Ghana and Nigeria.
11 For a sample of these reports see National Archives Kew, UNESCO Design Guidelines, Paris. UNESCO 1966–88, Overseas Building Notes, BRE, London, 50–73, 1950–73, and *West Africa Builder and Architect* Vol. 2, no. 4, pp. 77–79. Factors Governing School Building Programmes Harris and White, West African Building Research Institute Accra.
12 The AA Committee Minutes from 1960–1966 note the activities of the tropical studies unit, culminating in the formation of the Tropical School linked to the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana.
13 Built to house Katsina College, which moved from the city of Katsina to the teaching centre of Zaria in 1949. See Hubbard, J. P. (2000) *Education Under Colonial Rule: A History of Kastina College, 1921–1942*. Latham, NY: University Press of America.
14 Uduku, O. (2015) Spaces for 21st Century Learning. In *Routledge Handbook on International Learning and Development*. London: Routledge, pp. 196–209.
15 See Dmchowski, Z. R. (1990) *Introduction to Traditional Nigerian Architecture. Volume 1: Northern Nigeria*. London: Ethnographica, Denyer, S. (1978) *African Traditional Architecture*. London: Heinemann, and Schwerdtfeger, F. W. (1982) *Traditional Housing in Nigerian Cities: A Comparative Study of Houses in Zaria, Ibadan and Marrakech*. London: Wiley.
16 See Fry, M. and Drew, J. (1964) *Tropical Architecture in the Warm Humid Zone*. London: Architectural Press.
17 Fry, M. and Drew, J. (1948) *Village Housing in the Tropics*. London: Lund Humphries, See also Uduku O. (2014) and Jackson, I's introduction ~~in~~ (Jackson, 2013).
18 See Jackson, I. and Holland, J. (2016) *The Architecture of Maxwell Fry and Jane Drew*. London: Routledge, and Uduku, O. (2010) *Tropical Ivory Towers: A Critical Evaluation of Design Symbolism and Practical Aspirations of the West African University Campuses in Their Fifth Decade*. Docomomo, 11th International Conference, Mexico City.
19 Uduku, O. (2006, December) Modernist Architecture and 'the Tropical' in West Africa: The Tropical Architecture Movement in West Africa. *Habitat International*, 30(3), pp. 396–411, Bond, M. (1968, March) A Library for Bolgatanga. *Architectural Forum*, CXXV111, pp. 66–69, and Le Roux, H. (2003, September) The Networks of Tropical Architecture. *Journal of Architecture*, pp. 337–354.
20 Uduku, O. (2008) *Designing Schools as Development Hubs for Learning*. Final Report University of Bristol.

21 See Waddell, H. M. (1863) *The Diaries of H.M. Waddell and the Calabar Mission*. Edinburgh: National Library of Scotland Archives/Centre for Special Collections University of Edinburgh.
22 Both mission and government schools were entitled to varying forms of government aid towards the cost of teacher employment and school running costs.
23 The first Colonial Building Notes were published in the early 20th century.
24 These were primarily focused on improving military and naval performance in the tropics, where some theatres of war were situated (such as Libya and Singapore) or where troops had to travel through (e.g. Burma, Egypt and the West Indies).
25 BRE (1951–1967) building notes, various, and see also Le Roux (2006) in.
26 For example UNESCO consultants were involved in developing the design for model demonstration schools in Nigeria in the 1960s, see Uduku (2015) The Unity Schools Project.
27 UNESCO, *History*, www.unesco.org/new/en/unesco/about-us/who-we-are/history/. Accessed May 2017.
28 See De Raedt, K. (2014) Between True Believers' and Operational Experts: UNESCO Architects and School Building in Post Colonial Africa. *Journal of Architecture*, 19(1), pp. 19–42.
29 See Uduku (2015) in note 25.
30 Uduku (1992) and (2005) (PhD and Bristol).
31 Van Straaten, J. F., Richards, S. J. and Lotz, F. J. (1967). *Ventilation and Thermal Considerations in School Building Design*. Pretoria: CSIR.
32 See Uduku (1994). Today South Africa's CSIR continues its research into educational design and environmental conditions, but the guidelines for school design are covered via National Norms and Standards, which acknowledge the need to respond to local environmental conditions.
33 Baker, N. (1987) *Passive and Low Energy Building Design for Tropical Island Climates*. London: Commonwealth Secretariat. Koenigsberger, O. H. et al. (1973) *Manual of Tropical Building and Housing*. London: Thames and Hudson. Much of Koenigsberger's text emanated from research undertaken at the AA school of Tropical design and relevant UCL research into lighting, ventilation, etc., that sometimes overlapped with work undertaken by the BRE which published the Overseas Building Notes.
34 See, for example, www.cairns.qld.gov.au/__data/assets/pdf_file/0003/45642/BuildingDesign.pdf and www.bca.gov.sg/Sustain/sustain.html for Australia and Singapore, respectively. For Practical Action see: Stone, H. (2009) Schools Buildings in Developing Countries. *Practical Action, Technical Brief*. https://practicalaction.org//docs/technical_information_service/school_buildings_in_developing_countires.pdf.
35 For Practical Action, see note 34; MASS Design Material, https://massdesigngroup.org/ and Orkidstudio, https://orkidstudio.org/. Both accessed May 2017.
36 Uduku (1994a) and South African Government (2009) *Department of Education Notice, No. of 2009 The National Minimum Uniform Norms and Standards for School Infrastructure*.
37 Uduku (1994b), see P. (ed.) (2002) The History of Education Under Apartheid 1948–1994: The Doors of Learning and Culture Shall Be Opened. New York, NY: Peter Lang. book on schools in S. Africa (2006).
38 Uduku (2008) EdQual Final Report; South African Government (2009) *Department of Education Notice, No. of 2009 The National Minimum Uniform Norms and Standards for School Infrastructure*.
39 Fafunwa, B. (1974) *History of Education in Nigeria*. London: Allen and Unwin.
40 See, for example, Uduku (1993), Fafunwa, B. (1974) *History of Education in Nigeria*. London: Allen and Unwin, Ayandele, E. A. (1966) *The Missionary Impact on Modern Nigeria 1842-1914: A Political and Social Analysis*. London: Longman Green and Co., and Ajayi, J. F. A. (1965) *Christian Missions in Nigeria*

1841–1891: The Making of a New Elite. Evanston, IL: Northwestern University Press.

41 Source: Turner and Townsend (2017) *International Construction Market Survey*. www.turnerandtownsend.com/media/1518/international-construction-market-survey-2016.pdf. Accessed May 2017.

42 In Nigeria most of the historic schools that were initially located in the CBD area of Lagos Island moved to the suburbs as increased land costs in central Lagos during the 1970s during the 'oil-era', meant that school sites were acquired by business concerns. See, for example, Baptist Academy Lagos in Uduku (2004).

43 Uduku, O. (2015) Spaces for 21st Century Learning. In *Routledge Handbook on International Learning and Development*. London: Routledge, pp. 196–209.

44 Achebe, C. (2010) *The African Trilogy*. London: Everyman.

45 See Uduku, O. (2002) The Socio-Economic Basis of a Diaspora Community, Igbo bu'ike. *Review of African Political Economy*, 29(92), pp. 301–311.

46 See Ayandele, E. A. (1966) *The Missionary Impact on Modern Nigeria 1842–1914: A Political and Social Analysis*. London: Longman Green and Co. for a description of Eastern and Western Nigeria education schemes of the era.

47 See Le Roux, H. (2003, September) The Networks of Tropical Architecture. *Journal of Architecture*, pp. 337–354 and also for Ghana, Jackson and Holland (~~2014~~) Chapter 4. pp. 162–175 Missionaries and Modern Schools in Ghana.

48 Kallaway, P. (ed.) (2002) *The History of Education Under Apartheid 1948–1994: The Doors of Learning and Culture Shall Be Opened*. New York, NY: Peter Lang.

49 South African Govt. ~~(1948) Education Act.~~

50 The World Bank (2017) *History Page*. www.worldbank.org/en/about/history. Accessed in May 2017.

51 See Chapter 1.

52 Usually these policies were drawn up in collaboration with UNESCO, but the balance of policy and financial power had shifted to the World Bank by the 1980s.

53 See Psacharopoulos, G. (2006, May) World Bank Policy on Education: A Personal Account. *International Journal of Education Development*, pp. 329–338, and Theyuenk, S. (2009) *School Construction Strategies for Universal Primary Education in Africa: Should Communities Be Empowered to Build their Schools*? Washington, DC: World Bank.

54 Website information accessed for the Aga Khan School, Mombasa, Kenya, www.agakhanacademies.org/mombasa/financial-assistance and Atlantic Hall School, Nigeria, http://atlantic-hall.net/admissions-aids/scholarships/. Both accessed May 2017. The Aga Khan schools can provide some financial assistance to Kenyan nationals, but this depends on circumstances and available funding; Atlantic Hall has one full fee scholarship for the top performing student in the entrance examination.

55 As stated earlier, state provision is supposed to be free, but other costs related to textbooks and sometimes uniforms, etc., are often levied as being additional to free tuition; if fees are not paid in the state system, students are often excluded from school. In the private schools in informal settlements, there is often more negotiation about fees and a willingness of entrepreneurs to accept payments by instalment if required.

56 See The Economist (2015) The $ a week School, For Profit Education 1st August, 2015, but for a contrasting view see UNESCO (2015) *Rethinking Education for a Global Common Good*. http://unesdoc.unesco.org/images/0023/002325/232555e.pdf.

57 For *Ujaama* education, see Nyerere, J. (1968) Education for Self Reliance. In *Freedom and Socialism: A Selection From Writings & Speeches, 1965–1967*. Dar es Salaam: Oxford University Press and also Molony, T. (2015) *Nyerere, the Early*

Years. London: James Currey. For South Africa see Kallaway, P. (ed.) (2002) *The History of Education Under Apartheid 1948–1994: The Doors of Learning and Culture Shall Be Opened*. New York, NY: Peter Lang.

58 The education philosophers such as Freire, P. (1970) *Pedagogy of the Oppressed*. London: Penguin, and Psacharopoulos, G., Rojas, C. and Velez, E. (1993). Achievement Evaluation of Colombia's Escuela Nueva: Is Multigrade the Answer? *Comparative Education Review*, 37(3), pp. 263–276 had little influence on educational policies or design in Africa, compared to their adoption in Latin America (in countries such as Colombia and Ecuador) and parts of Asia, in particular India.

59 This is discussed further in Chapter 6.

60 See United Nations (2000) *Millennium Development Goals*. www.un.org/millenniumgoals/. Accessed May, 2017. MDGs and relationship to maternal child care and improved education. In the new Sustainable Development Goals this has been changed to Goal 4, 'ensuring quality and inclusive education for all and promoting lifelong learning'. See United Nations Sustainable Development Goals, www.un.org/sustainabledevelopment/sustainable-development-goals/. Accessed May 2017.

61 See Uduku, O. (2011) School Building Design for Feeding Programmes and Community Outreach: Insights From Ghana and South Africa. *International Journal of Educational Development International Journal of Education Development*, 31, pp. 59–66.

62 See Hentz, J. J. and Solomon, H. (2017) *Understanding Boko Haram: Terrorism and Insurgency in Africa*. Abingdon, Oxon; New York, NY: Routledge, Smith, M. G. (2015) *Boko Haram: Inside Nigeria's Unholy War*. London: I. B. Tauris, and Raufu, A. (2014) *Sects and Social Disorder*. London: James Currey.

63 See African Development Bank (ADB) (2017) *Africa's Urban Population Projection Statistics*, www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Tracking_Africa%E2%80%99s_Progress_in_Figures.pdf. Chapter 1. Accessed August 2017; and United Nations (2017) *Population 2050 Projections*, www.un.org/sustainabledevelopment/blog/2017/06/world-population-projected-to-reach-9-8-billion-in-2050-and-11–2-billion-in-2100-says-un/. Accessed August 2017.

64 See Mitra (2006) and Talbot, D. (2012) Given Tablets But No Teachers, Ethiopian Children Teach Themselves. *MIT Technology Review*. www.technologyreview.com/news/506466/given-tablets-but-no-teachersethiopian-children-teach-themselves/. Accessed May, 2017. See also UNESCO (2015), p. 49.

65 Arguably this is already the case and is backed by monetary bodies such as the World Bank, as is seen by the mixed educational economy in countries such as Nigeria, Ghana and Kenya. However, smaller countries and more historically socialist countries have had less deregulation of school provision.